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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,137

02/16/2005

Dirk Herbert Johan Teeuw

PHNL020765US1

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10/21/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

DEFRANK, JOSEPH S

ART UNIT

PAPER NUMBER

3724

MAIL DATE

DELIVERY MODE

10/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,137	Applicant(s) TEEUW ET AL.	
	Examiner JOSEPH DEFRANK	Art Unit 3724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to communication received on 10/1/08. Claims 1-18 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Independent claims 1 and 8 state the limitation "wherein the coating exceeds an average hardness which would be provided by a coating of diamond-like carbon." This claim is viewed as being indefinite in the sense that hardness is measured in many different ways. Many methods of measuring hardness have different scales and units making them somewhat incomparable. This is even more prevalent with respect to claims 9 and 11 which state the limitation "wherein the coating is approximately four times the hardness of Cr." The hardness of Cr, as most commonly accepted, is reported on two different scales: Brinell and Vickers. The hardness of superlattice structures tends to be reported using the nanoindentation hardness as the superlattice layers tend to be very thin. The scale of hardness needs to be specified.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-3, 6, 7, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sastri (US Patent 3,835,537 as previously cited) in view of Wong et al. (US Patent 5,776,615 as cited in IDS).

7. With respect to claims 1 and 2, Sastri discloses a cutting member (razor blade 20) having a metal substrate which is provided with a cutting edge (tapered portion shown in figure 2), at least a portion of the substrate including the cutting edge being provided with a coating (outer chromium coating 36, see column 5 lines 46-49), the coating is layered on the substrate in multiple coats as shown in figure 4. Sastri does not disclose the coating comprising carbon, characterized in that the coating comprises a plurality of stacked pairs of layers, each pair comprising a first layer mainly comprising carbon and a second layer mainly comprising a metal, and each pair having a thickness between 1 and 10 nm.

Wong et al. discloses a process for making superhard composite materials out of carbon and metal alternating layers for use in cutting devices. "The composite material may comprise a plurality of alternating layers comprising the carbon nitrogen compound each deposited on a respective layer of metal or metal compound to form a multi-layered, superlattice coating wherein each layer is ion bombardment densified during deposition and each layer has a thickness in the range of about 0.5 nm to about 100 nm (nanometer). Such a coating exhibits a hardness substantially exceeding (e.g. 2 times) the hardness of each individual layer in homogenous form" (column 4 lines 4-12).

Wong et al. also discloses that chromium is an acceptable metal to use as it falls within group VI of the periodic table of elements (see column 3 line 60). In the setup disclosed

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by Wong et al, the metal/carbon pair of a layer has a thickness from 1-200nm, which overlaps sufficiently with the range 1-10nm. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the solely chromium layers of Sastri with an alternating carbon nitrogen and chromium layered pair setup in view of the teachings of Wong et al. in order to create a harder cutting surface.

Further, the combined blade of Sastri in view of Wong et al. has the modified coating wherein the average hardness of the coating exceeds that of a coating of diamond-like carbon (DLC). CN_x on its own is considered an example of a DLC. DLC is broad enough to encompass any crystalline structure of a carbon based chemical compound. CN_x , as used by Wong et al., is in the crystal form (see column 3 line 53). When used in a superlattice coating with a metallic base, the hardness "substantially" exceeds that of the simple DLC form (column 4 line 11).

8. With respect to claim 3, Wong et al. discloses using the metal layer having a thickness ranging from 0.5 to 100 nm. 1.6 to 2.0 nm is fully encompassed by this range.

9. With respect to claims 6 and 7, Sastri in view of Wong et al. discloses that the total thickness of material added to the substrate by layering has a thickness of at least 400 Angstroms (40 nm; abstract of Sastri). No specific size of the total layer is given. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide enough layered pairs so that the thickness of the coating was in the range of 80 - 120 nm, since it has been held that where the general

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conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

10. With respect to claim 9, the modified apparatus of Sastri discloses the coating having a hardness approximately four times the hardness of Cr. Examiner notes that hardness is measured in many different ways because the term hardness can mean anything from resistance to shape change to resistance to scratching. As best understood, the superlattice structure of Sastri in view of Wong et al. results in a layered structure having a hardness of approximately four times that of chromium.

11. With respect to claims 10 and 11, the modified apparatus of Sastri discloses the coating having a resistance to wear which exceeds a resistance to wear provided by a coating of diamond-like carbon. Examiner notes that one measure of "a resistance to wear" is hardness itself. Since the coating disclosed by Sastri in view of Wong et al. is indeed harder than an example of a DLC, it has a higher resistance to wear. Likewise, a blade which doesn't wear as quickly as another also has a longer lifetime of use.

12. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sastri (US Patent 3,835,537 as previously cited) in view of Wong et al. (US Patent 5,776,615 as cited in IDS) as applied to claim 1 above, and further in view of Sanderson (US Patent 3,838,512 as previously cited).

Sastri in view of Wong et al. does not disclose a layer of Cr and a layer of CrN between the substrate and the layered pairs. Sanderson discloses a razor blade having a first layer of chromium to provide added strength and a second layer of a chromium based nitride which acts as better substrate for adhesion to following layers (column 7

lines 13-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a layer of chromium followed by a layer of chromium nitride before the stacked pairs of Sastri in view of Wong et al. based on the teachings of Sanderson in order to provide a stronger razor that is a better substrate for adhesion of a following layer.

13. Claims 8, 12-14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sastri in view of Wong et al. as applied to claims 1-3, 6, 7, and 9-11 above, and further in view of Grewal et al. (US Patent 5,142,785 as previously cited).

Sastri in view of Wong et al. does not disclose the blade of claim 1 being mounted in any sort of tool for shaving hair. Examiner notes that hand held razors are very common and well known in the art. The use of coated blades in the heads of these razors is also very well known in the art. Grewal et al. discloses mounting a coated razor blade in a shaver head (as shown in figure 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to mount the blade of Sastri in view of Wong et al. in a shaving apparatus in order to cut hair.

14. Claims s 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sastri in view of Wong et al. and further in view of Grewal et al. as applied to claims 8 above, and further in view of Sanderson.

The modified apparatus of Sastri does not disclose a layer of Cr and a layer of CrN between the substrate and the layered pairs. Sanderson discloses a razor blade having a first layer of chromium to provided added strength and a second layer of a chromium based nitride which acts as better substrate for adhesion to following layers

(column 7 lines 13-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a layer of chromium followed by a layer of chromium nitride before the stacked pairs of the modified blade of Sastri based on the teachings of Sanderson in order to provide a stronger razor that is a better substrate for adhesion of a following layer.

Response to Arguments

15. Applicant's arguments filed with respect to claims 1-14 have been fully considered but they are not persuasive.

16. With respect to claims 1-8, Applicant argues that "Wong does not show a first layer mainly comprising carbon and a second layer mainly comprising a metal and that Wong is merely able to achieve a hardness that approaches the hardness of diamond film while the Applicants are able to achieve a coating that exceeds an average hardness which would be provided by a coating of diamond-like carbon." Wong does indeed disclose the first layer mainly comprising carbon as the first layer is CN_x where x ranges from 0.1 to 1.33. In the instances where x is 0.1 through 0.99, the first layer clearly is comprised mainly of carbon. The second layer is a "metal seed material... selected from the group consisting of a Group IIB, IIIB, IVB, VB, VIB, and VIIB metal, metalloid, and transition metal of the Periodic Table," (column 3 lines 59-61). Examiner further points out that diamond-like carbon is not the same as diamond. A diamond-like carbon is merely any carbon based substance in a crystal form. CN_x is considered a DLC and when used in the superlattice structure of Wong et al., the hardness is

increased over the hardness of just the DLC alone (as is claimed by the Applicant).

Applicant never claims a hardness harder than diamond.

17. With respect to claims 4 and 5 (also 15 and 16), Applicant argues that Sanderson does not disclose "an implanted Cr layer nor does Sanderson show that the disclosed layer is positioned other than as an outer layer." Examiner respectfully disagrees with the Applicant's argument. Sanderson discloses a razor blade having a first layer of chromium to provided added strength and a second layer of a chromium based nitride which acts as better substrate for adhesion to following layers (column 7 lines 13-24). The chromium based nitride is not the outer layer of the razor blade embodiment relied upon. The chromium based nitride is the outer of the Cr-CrN layers, but further layers are provided. The CrN layer provides better adhesion for a crystal layer (see column 7 lines 13-24). Further layers are applied.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH DEFRANK whose telephone number is (571)270-3512. The examiner can normally be reached on Monday - Thursday; 9am-6pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer Ashley can be reached on (571) 272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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